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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,649	05/24/2000	William C. Treurniet	1245.007	4450
23405	7590	11/16/2005	EXAMINER	
HESLIN ROTHENBERG FARLEY & MESITI PC 5 COLUMBIA CIRCLE ALBANY, NY 12203			TRAN, CON P	
			ART UNIT	PAPER NUMBER
			2644	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/577,649	TREURNIET ET AL.	
	Examiner	Art Unit	
	Con P. Tran	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on October 17, 2005 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. **Claims 1-2, 5, 7, 9-10, 13-14** are rejected under 35 U.S.C. 102(a) as being anticipated by Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes")).

Regarding **claim 9**, Colomes teaches a system for determining an objective audio quality measurement of a target audio signal, comprising:

a peripheral ear processor (artificial ear) for processing a reference audio signal (i.e., minimum masking curve level) and a target audio signal (i.e., maximum audio signal level) to provide a reference basilar sensation signal and a target basilar sensation signal, respectively (page 238, left column, pars. 3-5; page 234, left column, pars. 2, 3, right column, par. 2);

a comparator for comparing the reference basilar sensation signal and the target basilar sensation signal to determine a basilar degradation signal (calculate the difference; page 238, left column, pars. 5,6); and

a cognitive processor for processing the basilar degradation signal to determine a plurality of cognitive model components (i.e., excitation curves, excitation values, page 235, right column; spectral bandwidth 1 bark wide, page 236, right column) for providing an objective perceptual quality rating (using spreading function, page 235, left column, last paragraph - page 235, right column, second paragraph; page 234, left column, pars 4,5) quantifying the perceptual difference between the reference audio signal and the target audio signal (determining how much degradation based on threshold and probability of basilar representation of both signals, e.g., difference limen, then modifying probability P_i , page 236, left column).

Colomes thus teaches all the claimed limitations.

Art Unit: 2644

Regarding **claim 10**, Colomes teaches a system according to claim 9, wherein the a plurality of cognitive model components (i.e., excitation curves, excitation values, page 235, right column; spectral bandwidth 1 bark wide, page 236, right column) is selected from coefficient of variation of distortion (i.e. upper slope; page 235, left column, last paragraph - page 235, right column, second paragraph).

Regarding **claim 13**, Colomes teaches a system according to claim 9, wherein the cognitive processor includes pre-processing means for determining effects of at least one of perceptual inertia, perceptual asymmetry (page 237, left column, second paragraph) and adaptive threshold (i.e., below a threshold σ , there will be no detection (page 236, left column, first paragraph)).

Regarding **claim 14**, Colomes teaches a system according to claim 9, wherein the peripheral ear processor includes a recursive filter (low pass filter in [8], i.e., autoregressive filter in Paillard et al., page 24, right column, prior art in record; see Colomes page 234, right column, paragraph 2).

Regarding claims **1, 2, 7, and 5**, these claims merely reflect the process to the apparatus claim of claims 9, 10, 13, and 14, respectively and are therefore rejected for the same reasons.

Claim Rejections - 35 USC § 103

Art Unit: 2644

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 3 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes") in view of Hunt U.S. Patent 5,809,453.

Regarding **claim 11**, Colomes teaches a system according to claim 9. Colomes further discloses using threshold and power density spectrum in detecting tone input. However, Colomes does not explicitly disclose wherein the peripheral ear processor further provides a harmonic structure from an error spectrum obtained through a comparison of the reference and target audio signals.

Hunt discloses method and apparatus for detecting harmonic structure in a waveform (col. 1, lines 7-11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a method and apparatus for detecting harmonic structure of Hunt with Colomes artificial ear model for purpose of determining an estimate of the periodicity of the wave form, as suggested by Hunt in column 2, lines 54-55).

Regarding **claim 3** this claim merely reflects the process to the apparatus claim of claim 11, and is therefore rejected for the same reasons.

6. **Claims 4, 6, 12 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes") in view of Hollier U.S. Patent 5,621,854.

Regarding **claim 12**, Colomes teaches a system according to claim 9. However, Colomes does not explicitly disclose wherein the cognitive processor includes a multi-layer neural network.

Hollier teaches method and apparatus for objective speech quality measurement (Title) in which an analysis unit (8, Fig. 2) having outputs being combined by processing of a neural network (col. 11, line 59 – col. 12, line 12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a neural network of Hollier with Colomes artificial ear model for purpose of providing a signal indicating the perceptual significance of the distortion in the signal, as suggested by Hollier in column 12, lines 8-9).

Regarding **claim 15**, Hollier further teaches a system according to claim 9, wherein the cognitive processor includes weighting means for adjacent frequency ranges (col. 9, lines 5-31; Fig. 9).

Regarding claims **4 and 6**, these claims merely reflect the process to the apparatus claim of claims 12 and 15 and are therefore rejected for the same reasons.

7. **Claims 8 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes") in view of International Telecommunication Union- Radiocommunication Sector BS.1387 (1998) (hereinafter, "ITU-R BS 1387").

Regarding **claim 16**, Colomes teaches a system according to claim 9. However, Colomes does not explicitly disclose wherein the cognitive processor includes adjustment means for adjusting the basilar degradation signal according to a variance of auditory filter envelope modulation rates of the reference audio signal.

ITU-R BS.1387 teaches an objective measurement of perceived audio quality in which a cognitive processor includes adjustment means for adjusting the basilar degradation signal according to a variance of auditory filter envelope modulation rates of the reference audio signal (Table 4, pages 13-14; page 16, paragraph 7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated an objective measurement of perceived audio

Art Unit: 2644

quality of ITU-R BS.1387 with a perceptual model of Colomes for purpose of providing an accurate model of a peripheral auditory system as well as cognitive aspects of audio quality judgment, as suggested by ITU-R BS.1387 in page 15, paragraph 3.

Regarding claim 8, this claim merely reflects the process to the apparatus claim of claim 16 and is therefore rejected for the same reason.

Response to Arguments

8. Applicants' arguments filed October 17, 2005 regarding claims 1-16 have been fully considered but they are moot in view of new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (571) 272-7532. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivian C. Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Application/Control Number: 09/577,649

Page 9

Art Unit: 2644

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cpt CPJ
November 4, 2005

2

XU MEI
PRIMARY EXAMINER